

Erosion and Deposition ▪ *Section Summary*

The Force of Moving Water

Guide for Reading

- What enables water to do work?
- How does sediment enter rivers and streams?
- What factors affect a river's ability to erode and carry sediment?

A river's water has energy. **Energy** is the ability to do work or cause change. There are two kinds of energy. **Potential energy** is energy that is stored and waiting to be used later. **Kinetic energy** is the energy an object has due to its motion. **As gravity pulls water down a slope, the water's potential energy changes to kinetic energy that can do work.** All along a river, moving water causes changes. A river is always moving sediment from place to place. At the same time, a river is also eroding its banks and its valley.

In the process of water erosion, water picks up and moves sediment. Sediment can enter rivers in a number of ways. **Most sediment washes or falls into a river as a result of mass movement and runoff. Other sediment erodes from the bottom or sides of the river.** Wind may also drop sediment into the water. Abrasion is another process by which a river obtains sediment. **Abrasion** is the wearing away of rock by a grinding action.

The amount of sediment that a river carries is its **load**. Gravity and the force of moving water cause sediment to move downstream.

A river's slope, its volume of flow, and the shape of its streambed all affect how fast the river flows and how much sediment it can erode. A fast-flowing river carries more and larger particles of sediment. When a river slows down, it deposits some of its sediment load. Generally, as a river's slope increases, its speed also increases. A river's slope is the amount the river drops toward sea level over a given distance. If a river's speed increases, its sediment load and power to erode may increase. A river's flow is the volume of water that moves past a point on the river at any given time. As more water flows through a river, its speed increases.

Friction is the force that opposes the motion of one surface as it moves across another surface. Friction affects a river's speed. Where a river is deep, less water comes in contact with the streambed. This reduces friction and allows the river to flow faster. In a shallow river, there is more friction, which reduces the river's speed. A streambed is often full of boulders and other obstacles. This roughness increases friction and reduces a river's speed. The water moves every which way in a type of movement called **turbulence**. Turbulence slows a stream's flow, but a turbulent stream has great power to erode.

The shape of a river affects the way it deposits sediment. Deposition occurs along the sides of a river, where the water moves more slowly. If a river curves, the water moves fastest on the outside of the curve. There, the river erodes. On the inside of the curve, where the speed is slowest, the river deposits sediment.